Support Note for GCC Waste Core Strategy HRA final report
Issued 17th May 2011

Introduction and Background

ERM were commissioned to undertake a Habitats Risk Assessment on behalf of Gloucester County Council. From the perspective of air quality, the assessment focussed on assessing the potential impacts of the emissions arising from a thermal waste treatment plant (assumed to be an Energy from Waste plant) on European designated sites (ie Special Areas of Conservation, Special protection Areas and RAMSAR sites). The assessment considered a number of sites across the county and established which would be suitable for development of a plant without having significant impacts on European designated sites. The air quality element of the assessment utilised detailed dispersion modelling to quantify impacts of emissions from the waste treatment plant on European designated sites.

Within the assessment a staged approach was used, whereby initially a 400,000 tonne per annum plant (tpa) with an 80m stack was modelled. Where potentially significant impacts were identified, the capacity of the plant was reduced to firstly 200,000 tpa, and then 100,000 tpa, and the stack height was increased from 80m to 100m.

The reduction in capacity of the plant from 400,000 tpa to 200,000 tpa and 100,000 tpa results in less exhaust gases being produced as a direct consequence of the reduced amount of waste being processed. Within the modelling, the exit velocity should be maintained at approximately 20m/s, and the flue diameter and volume flow rate reduced to maintain the exit velocity. In error, instead the flue diameter was kept static and the volume flow rate reduced. This resulted in the exit velocity being underestimated, by a 50% in the case of the 200,000 tpa and 75% in the case of the 100,000 tpa scenario. The reduction in exit velocity will reduce the rise of the plume as it is released from the stack, and therefore have an impact upon the dispersion of the plume and subsequent predicted impacts.

On this basis, additional modelling was undertaken to ascertain the magnitude of change in the results of the assessment and ascertain whether the error is likely to lead to significant changes in the conclusions of the assessment.

Summary of Test Results

The modelling reported in Annex B of the main HRA report have been modelled using a flue diameter of 2.81m, this has resulted in the exhaust gas exit velocity being modelled at approximately 10m/s for the 200,000 tpa and at approximately 5m/s for the 100,000 tpa scenario.

In order to ascertain whether there is the potential for significant changes in the conclusions of the, two scenario's were remodelled using the correct exit velocity, and stack diameter. Initially, ERM were of the opinion that it is unlikely that the error will result in significant changes in the results; this arises from the fact that the momentum of the plume as a result of the exit velocity is relatively short lived upon release.

This initial view was confirmed by the test models which have shown the differences to be negligible.

The results of the test models are presented below.

Test runs using the correct model parameters have been completed for 100ktpa and 200ktpa throughput for:

- Potential impacts from Easter Park on Bredon Hill; and
- Potential impacts from Moreton Valance on Cotswolds Beechwoods.

The key findings are:

- For a development at Easter Park, the impacts on Bredon Hill:
    - Decrease by 0.11% for the 200,000 tpa scenario; and
    - Increase by 1.76% for the 100,000 tpa scenario.
- For a development at Moreton Valance, the impacts on Cotswolds Beechwoods:
    - Increase by 0.08% for the 200,000 tpa scenario; and
    - Increase by 1.92% for the 100,000 tpa scenario.

Based upon these results, the actual predicted contribution of the modelled waste management process to each site has been calculated to illustrate the actual impact upon the findings of the assessment. *Table 1* presents a comparison of the PC (Process Contribution, this being the impact from the plant) and the PEC (this being the PC added to the existing baseline) to the relevant Critical Loads. These parameters are used to determine the significance of any predicted impact, and ultimately it is these results which are used as the basis for making informed decisions.

Table.1 ***Comparison of modelling results for 'as reported' and 'corrected' for acid deposition***

Scenario	**% difference between test and reported models**	**Acid deposition PC/CL**		**Acid deposition PEC/CL**	
		As reported	**Corrected results**	**As reported**	**Corrected results**
Easter Park on Bredon Hill (100kpta, 80m stack)	1.76%(increase)	1.49%	1.51%	71.7%	71.7%
Easter Park on Bredon Hill (200ktpa, 80m stack)	0.11%(decrease)	2.86%	2.86%	73.1%	73.1%
Moreton Valance on Cotswolds Beechwoods (100ktpa, 80m stack)	1.92%(increase)	2.17%	2.21%	87.6%	87.7%
Moreton Valance on Cotswolds Beechwoods (200ktpa, 80m stack)	0.08%(decrease)	3.70%	3.70%	89.1%	89.1%

Conclusion

The results set out in Table 1 suggest that the error in the modelling will have no material bearing on the findings of the assessment. Therefore there is considered no need to update the air dispersion modelling report Annex B of the main HRA report as the conclusions of the assessment will not change.